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EXAMINER

AKRAM, IMRAN

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

08/18/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 5/8/08 have been fully considered but they are not persuasive.
2. In response to the argument that neither Ekstrom nor Kaneko discloses spraying steam in the catalyst reforming step or onto the lower portion of a fixed adsorbent, Examiner disagrees with Applicant's assertion that in combination both references do not suggest this. Kaneko discloses spraying means (paragraph 403) and the motivation to use them (paragraph 569) in multiple stages of the Ekstrom invention (see rejection below). The Ekstrom reference would be capable of this improvement.
3. Regarding claim 11, Applicant asserts that the Kaneko reference does not teach the conversion *into* ammonia. This, however, is a spurious argument as it is not a necessity for anticipation given the present claim language. Examiner interpreted claim 11 to read "into an alkane compound" or into "an alkene compound and NH₃," as it is written in the alternative; as seen in paragraph 226 of Kaneko, an alkane compound is formed. Applicant is suggested to more clearly define their claimed invention.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ekstrom (US 5,213,587) in view of Kaneko (US 2002/0159929 A1).

8. Regarding claim 6, Ekstrom discloses: a fuel supplying step of supplying a refined mixture including biomass organic waste (column 1, lines 31-35), coal (column 1, lines 63-65), and heavy oil (column 1, lines 14-18) to a middle portion of a gasifier (see abstract); a catalytic circulating fluidized-bed gasification step of drying (column 5, lines 51-54), volatilizing and low-temperature catalytic gasifying (column 1, lines 31-35), and partially burning the fuel using hot air and superheated steam in the presence of a

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catalyst (column 2, lines 46-47), the active material to be calcium-magnesium carbonate (column 4, lines 25-30); a collecting step of collecting dust in the gas generated in the catalytic circulating fluidized gasification step (column 3, lines 10-19); a catalyst reforming step of reforming the gas through a lower layer of fixed adsorbent bed and the refined mixture through an upper layer of fluidized catalyst bed (column 3, lines 49-61); a heat exchanging step of cooling the gas to 200°C or less (column 5, lines 17-22) and transferring condensed liquid to a tar-storing bath (see abstract); a tar scabbing step of condensing non-converted tar or non-condensed liquid to be recovered, and gas stripping the condensed liquid (column 2, lines 24-31); and a gas-storing step of compressing the gas (column 6, lines 3-8). Reforming tar-nitrogen, aromatic-nitrogen, phosphorous, and sulfur through the upper layer of fluidized catalyst bed is inherent to the process of Ekstrom as these are all constituents and byproducts of the reaction fuels. Also, gas product storage is inherent as the product would need to be put somewhere. What Ekstrom does not disclose, however, is the use of a screw feeder for fuel injection into the gasifier, the use of steam spraying for the prevention of clogging, or the removal of hydrogen sulfide by absorption.

9. Screw feeders are well known injection means in the art as can be found in Kaneko. Kaneko discloses a gasification process that uses a screw feeder for the fuel hopper (paragraph 103). While Kaneko teaches away from a fluidized reaction bed, the use of screw feeder of Kaneko does not prevent its use in Ekstrom. It would have been obvious to one having ordinary skill in the art at the time of invention to incorporate for

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screw feeder of Kaneko with the fuel insertion means of Ekstrom in order to allow fuel injection through desirably different angles of insertion (see paragraph 105 of Kaneko).

10. While Ekstrom discloses reformation temperature to be below 650°C (column 5, lines 8-16), Ekstrom does not disclose the use of steam spraying or the prevention of clogging. Kaneko, however, as an aforementioned analogous invention, discloses the use of steam spraying (paragraph 403) and the importance of avoiding clogging in the line (paragraph 569). It would have been obvious to one having ordinary skill in the art at the time of invention to use steam spraying as to prevent line clogging since clogging would adversely affected the process in a negative way.

11. Ekstrom does not disclose the removal of hydrogen sulfide by absorption (column 1, lines 51-65). Since the active material is calcium the creation of calcium sulfide is inherent, as is the creation of a phosphorous halide.

12. Regarding claim 11, Ekstrom discloses the decomposition of tar into alkene compounds and ammonia using a catalytic material (column 4, lines 39-48), but fails to specify if the catalyst can be a single metal catalyst. Kaneko, however, discloses the use of a nickel catalyst for tar decomposition (paragraph 224). It would have been obvious to one having ordinary skill in the art at the time of invention to use a nickel catalyst that Kaneko discloses for the conversion of tar that Ekstrom teaches since the nickel catalyst converts the tar. The catalyst of Kaneko is capable of use with Ekstrom, with or without the fluidized bed.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IMRAN AKRAM whose telephone number is (571)270-3241. The examiner can normally be reached on 10-7 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

IA

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795